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L4	1	10/796563	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2007/09/18 23:46
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L6	2	"20040131025".pn.	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2007/09/18 23:46
L7	62	((("space-time" or (space adj time)) with cod\$3) and ((ultra with (wideband or (wide adj band))) or (UWB)))	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2007/09/18 23:46
L8	4	(space with time with coding) with ((ultra with wideband) or (UWB))	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2007/09/18 23:46

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L9	4	(space with time with coding) same ((ultra with wideband) or (UWB))	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2007/09/18 23:46
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L11	2313	375/267	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2007/09/18 23:46
L12	7	((("space-time" or (space adj time)) with cod\$3) with ((ultra with (wideband or (wide adj band))) or (UWB))	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2007/09/18 23:46
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L14	1572	455/101	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2007/09/18 23:46
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L20	3	L7 and L14	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2007/09/18 23:46
L21	151	(pulse adj position adj modulation) and (pulse adj amplitude adj modulation) and ((ultra with wideband) or (UWB))	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2007/09/18 23:46
L22	3	"6,556,621".pn.	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2007/09/18 23:46

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L24	43	(pulse adj position adj modulation) with (pulse adj amplitude adj modulation) with ((ultra with wideband) or (UWB))	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2007/09/18 23:46
L25	69	(pulse adj position adj modulation) same (pulse adj amplitude adj modulation) same ((ultra with wideband) or (UWB))	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2007/09/18 23:46

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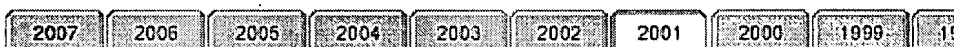
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Volume 34 , Issue 6 (June 2001) [table of contents](#)
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ISSN:0018-9162**Author** [David G. Leeper](#)**Publisher** IEEE Computer Society Press Los Alamitos, CA, USA**Additional Information:** [abstract](#) [references](#) [cited by](#) [index terms](#)**Tools and Actions:** [Find similar Articles](#) [Review this Article](#)
[Save this Article to a Binder](#) [Display Formats: BibTex](#) [EndNote](#) [ACM Ref](#)**DOI Bookmark:** [10.1109/2.928620](#)↑ **ABSTRACT**

Economic forces and physical laws are driving the growth of a new wireless infrastructure that will become as ubiquitous as lighting and power infrastructures are today. Many expect that the next-generation cellular systems built upon this foundation will bring fast, nearly ubiquitous, wireless data connections to users. At the heart of this new infrastructure lies short-range wireless, a complementary class of emerging technologies meant primarily for indoor use over very short distances. SRW links will offer peak speeds of tens or even hundreds of megabits per second-- at very low cost and with very low power--to many closely spaced users. In its base set of applications, SRW technologies will provide cableless connections among the portable devices people wear and carry daily, including cell phones, headsets, PDAs, laptop computers, digital cameras, audio and video players, and health monitoring devices. Given that SRW links will be unlicensed, and that owners of individual premises rather than government authorities will grant installation permissions, SRW business models may differ radically from those of traditional telecom carriers. Some carriers may see SRW as a threat and actively oppose it, while others may see it as a powerful complement to their current technologies.

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↑ **INDEX TERMS**

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A simple transmit diversity technique for wireless commu

Alamouti, S.M.

AT&T Wireless Services, Redmond, WA;

This paper appears in: Selected Areas in Communications, IEEE Journal on

Publication Date: Oct 1998

Volume: 16, Issue: 8

On page(s): 1451-1458

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Abstract

This paper presents a simple two-branch transmit diversity scheme. Using two transmit and two receive antennas the scheme provides the same diversity order as maximal-ratio receiver combining with one transmit antenna, and two receive antennas. It is also shown that the scheme may be generalized to two transmit antennas and M receive antennas to provide a diversity order of M . The scheme does not require any bandwidth expansion or any feedback from the receiver to the transmitter. Its computational complexity is similar to M-PSK.

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Author Keywords

Not Available

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 ...communication system 2. **UWB** system 2 includes a transmitter...receiver 6 by transmitting **UWB** waveforms through a plurality...hereinafter, "channels 8"). **Space-time** (ST) coding techniques are...transmitted via multiple **antennas**. Transmitter 4 may include...to transmit a ST-encoded **UWB** waveform from the transmit...4 processes a stream of **information-bearing symbols** and transmits each ST-encoded...
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5. **M-ary Signals in UWB MIMO System Using Orthogonal Space Time Block**

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- ☐ 6. **On decoding algorithm and performance of space-time block codes**
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- ☐ 7. **Differential space-time ultra-wideband communications**
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- ☐ 9. **Achieving Rate Two Space-Time-Frequency Codes for Multiband UWB-MC Communication Systems Using Rotated Multidimensional Modulation**
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10796563

Claims Priority from Provisional Application 60453810

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Contents

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YANG, LIUQING	FALCON HEIGHTS	MINNESOTA

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Inventor Name Search Result

Your Search was:

Last Name = GIANNAKIS

First Name = GEORGIOS

Application#	Patent#	Status	Date Filed	Title	Inventor Name
60274365	Not Issued	159	03/08/2001	Chip-interleaved block-spread code division multiple access	GIANNAKIS, GEORGIOS
60274367	Not Issued	159	03/08/2001	Finite-alphabet based channel estimation for OFDM and related multi-carrier systems	GIANNAKIS, GEORGIOS
60906989	Not Issued	20	03/14/2007	Stochastic routing in wireless multihop networks	GIANNAKIS, GEORGIOS
09838621	6912241	150	04/19/2001	CHIP-INTERLEAVED, BLOCK-SPREAD MULTI-USER COMMUNICATION	GIANNAKIS, GEORGIOS B.
10094946	7139321	150	03/07/2002	CHANNEL ESTIMATION FOR WIRELESS OFDM SYSTEMS	GIANNAKIS, GEORGIOS B.
10158390	7190734	150	05/28/2002	SPACE-TIME CODED TRANSMISSIONS WITHIN A WIRELESS COMMUNICATION NETWORK	GIANNAKIS, GEORGIOS B.
10420351	Not Issued	30	04/21/2003	Space-time coding using estimated channel information	GIANNAKIS, GEORGIOS B.
10420352	7224744	150	04/21/2003	SPACE-TIME MULTIPATH CODING SCHEMES FOR WIRELESS COMMUNICATION SYSTEMS	GIANNAKIS, GEORGIOS B.
10420353	Not Issued	93	04/21/2003	WIRELESS COMMUNICATION SYSTEM HAVING LINEAR ENCODER	GIANNAKIS, GEORGIOS B.
10420361	7251768	150	04/21/2003	WIRELESS COMMUNICATION SYSTEM HAVING ERROR-CONTROL CODER AND LINEAR PRECODER	GIANNAKIS, GEORGIOS B.
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	Issued			CODING SCHEMES FOR TIME-SELECTIVE WIRELESS COMMUNICATION CHANNELS	GEORGIOS B.
<u>10796563</u>	Not Issued	41	03/08/2004	Space-time coding for multi-antenna ultra-wideband transmissions	GIANNAKIS, GEORGIOS B.
<u>10796567</u>	Not Issued	41	03/08/2004	Timing synchronization using dirty templates in ultra wideband (UWB) communications	GIANNAKIS, GEORGIOS B.
<u>10796570</u>	Not Issued	41	03/08/2004	Pilot waveform assisted modulation for ultra-wideband communications	GIANNAKIS, GEORGIOS B.
<u>10796895</u>	Not Issued	30	03/08/2004	Multi-user interference resilient ultra wideband (UWB) communication	GIANNAKIS, GEORGIOS B.
<u>10828104</u>	Not Issued	30	04/20/2004	Space-time-frequency coded OFDM communications over frequency-selective fading channels	GIANNAKIS, GEORGIOS B.
<u>10841806</u>	Not Issued	41	05/07/2004	Receiver for chip-interleaved block-spread multi-user communication systems	GIANNAKIS, GEORGIOS B.
<u>10850825</u>	Not Issued	41	05/21/2004	Channel estimation for block transmissions over time-and frequency-selective wireless fading channels	GIANNAKIS, GEORGIOS B.
<u>10850961</u>	Not Issued	41	05/21/2004	Estimating frequency-offsets and multi-antenna channels in MIMO OFDM systems	GIANNAKIS, GEORGIOS B.
<u>10952713</u>	Not Issued	30	09/29/2004	Pulse shaper design for ultra-wideband communications	GIANNAKIS, GEORGIOS B.
<u>10953493</u>	Not Issued	30	09/29/2004	Digital carrier multi-band user codes for ultra-wideband multiple access	GIANNAKIS, GEORGIOS B.
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	Issued			TRANSMISSIONS WITHIN A WIRELESS COMMUNICATION NETWORK	GEORGIOS B.
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<u>60293476</u>	Not Issued	159	05/25/2001	Space-time coded transmission with maximum diversity gains over frequency-selective multipath fading channels	GIANNAKIS, GEORGIOS B.
<u>60374886</u>	Not Issued	159	04/22/2002	Transceiver designs combining complex-field coding with galois-field coding and low-complexity turbo-decoding for wireless fading communication channels	GIANNAKIS, GEORGIOS B.
<u>60374933</u>	Not Issued	159	04/22/2002	Optimal transmitter eigen-beamforming and space time block coding based on partial channel state information	GIANNAKIS, GEORGIOS B.
<u>60374934</u>	Not Issued	159	04/22/2002	Space-time-multipath coding using digital phase sweeping and block circular delay diversity for wireless transmissions over frequency-selective fading channels	GIANNAKIS, GEORGIOS B.
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<u>60453659</u>	Not Issued	159	03/08/2003	Low-complexity training for timing acquisition in ultra wideband communications	GIANNAKIS, GEORGIOS B.
<u>60453803</u>	Not Issued	159	03/08/2003	Non-data aided timing-offset estimation for ultra-wideband transmissions using cyclostationarity	GIANNAKIS, GEORGIOS B.
<u>60453804</u>	Not Issued	159	03/08/2003	Optimal pilot waveform assisted modulation for ultra wideband communications	GIANNAKIS, GEORGIOS B.
<u>60453809</u>	Not Issued	159	03/08/2003	Multi-user interference resilient algorithms for ultra-wideband multiple access through multipath	GIANNAKIS, GEORGIOS B.

				channels	
60453810	Not Issued	159	03/08/2003	Analog space-time coding for multi-antenna ultra-wideband transmissions	GIANNAKIS, GEORGIOS B.
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60469611	Not Issued	159	05/09/2003	Receiver for chip-interleaved, block-spread multi-user communication system	GIANNAKIS, GEORGIOS B.
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60472297	Not Issued	159	05/21/2003	Estimating frequency-offsets and multi-antenna channels for MIMO OFDM	GIANNAKIS, GEORGIOS B.
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60507269	Not Issued	159	09/30/2003	Digital carrier multi-band user codes for ultra wide band multiple access	GIANNAKIS, GEORGIOS B.
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60507829	Not Issued	159	10/01/2003	Full-diversity full-rate complex-field space-time coding	GIANNAKIS, GEORGIOS B.
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60615489	Not Issued	159	10/01/2004	Noncoherent ultra-wideband radios	GIANNAKIS, GEORGIOS B.
60615802	Not Issued	159	10/04/2004	Low-complexity blind synchronization and demodulation	GIANNAKIS, GEORGIOS B.

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Inventor Name Search Result

Your Search was:

Last Name = YANG

First Name = LIUQING

Application#	Patent#	Status	Date Filed	Title	Inventor Name
10796563	Not Issued	41	03/08/2004	Space-time coding for multi-antenna ultra-wideband transmissions	YANG, LIUQING
10796567	Not Issued	41	03/08/2004	Timing synchronization using dirty templates in ultra wideband (UWB) communications	YANG, LIUQING
10796570	Not Issued	41	03/08/2004	Pilot waveform assisted modulation for ultra-wideband communications	YANG, LIUQING
10796895	Not Issued	30	03/08/2004	Multi-user interference resilient ultra wideband (UWB) communication	YANG, LIUQING
10952713	Not Issued	30	09/29/2004	Pulse shaper design for ultra-wideband communications	YANG, LIUQING
10953493	Not Issued	30	09/29/2004	Digital carrier multi-band user codes for ultra-wideband multiple access	YANG, LIUQING
11242623	Not Issued	30	10/03/2005	Noncoherent ultra-wideband (UWB) demodulation	YANG, LIUQING
60453659	Not Issued	159	03/08/2003	Low-complexity training for timing acquisition in ultra wideband communications	YANG, LIUQING
60453803	Not Issued	159	03/08/2003	Non-data aided timing-offset estimation for ultra-wideband transmissions using cyclostationarity	YANG, LIUQING
60453804	Not Issued	159	03/08/2003	Optimal pilot waveform assisted modulation for ultra wideband communications	YANG, LIUQING
60453809	Not Issued	159	03/08/2003	Multi-user interference resilient algorithms for ultra-wideband multiple access through multipath channels	YANG, LIUQING

60453810	Not Issued	159	03/08/2003	Analog space-time coding for multi-antenna ultra-wideband transmissions	YANG, LIUQING
60507269	Not Issued	159	09/30/2003	Digital carrier multi-band user codes for ultra wide band multiple access	YANG, LIUQING
60507303	Not Issued	159	09/30/2003	Pulse-shaper design for ultra-wideband radio communication	YANG, LIUQING
60615489	Not Issued	159	10/01/2004	Noncoherent ultra-wideband radios	YANG, LIUQING

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